NAVAJO COMMUNITY COLLEGE
1992 Summer Youth Institute

FINAL REPORT
Grant #: NAGW-2732
Supplement: 2

by

Navajo Community College
Student Services
ATTN: Merton Sandoval, Dean of Student Services

Tsaile, Arizona 86556

Navajo Community College
1992 Math and Science Summer Youth Institute

REPORT TO NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

INTRODUCTION:

Funding provided by the NASA Grant enables Navajo Community College to expand its outreach to groups underrepresented in the fields of math and science. A model program was implemented in 1990 to address the underrepresentation of American Indian people in math and science. The model includes the following:

-For pre-college students: early exposure to college work and college life through an intensive summer experience in math and science

-For pre-college students: close personal contact with Math and Science Summer Youth Institute coordinators and expending throughout the academic year.

-For parents: a summer program orientation session, school visits, and other support services

-For counselors: school visits, and other support services

NASA funding has been used to support and expand the pre-college summer component of the Math and Science Summer Youth Institute Program. The number of participants was decreased from 160 to 30 due to the strong entrance criteria and late advertisement. There is no other financial support from other entities.

The summer program provided an opportunity for Native American freshmen high school students to experience college in both an academic and social context and to enhance academic preparation to enter technical fields through related college disciplines. The Math and Science Summer Youth Institute main focus is that of increasing the pool of students interested in math and science.

After completion of the academic summer program, students are included in an academic year activity. Progress of students who complete the summer experience is monitored as their education continues through an annual follow-up study.

PROGRAM DESCRIPTION

The summer program is residential and provides an opportunity for students to experience college in both academic and social contexts. Navajo Community College-Tsaile is located in a rural setting and program participants come from areas throughout New Mexico and Arizona , the residential component of the program was designed to meet specific recognized needs of Native American high school students. An instructor shared some of his thoughts regarding the importance of Navajo Community College's summer program:

"There were many positive and constructive portions of the program. These young people were given an opportunity to see many new places and learn new things. The fact that they learned about their own culture in addition to the other topics was important. Also important was the fact other Native Americans and Navajos have made great contributions in the worlds of science and technology."

Participant Selection

High school freshmen students who had a strong math and science background and a minimum G.P.A. of 3.0 were eligible for the program. Students were selected by committee composed of Student Services staff, Program Coordinator and Student Resident Advisors (S.R.A.'s). A total of 30 students were selected from 50 applications on the basis of grade point average, achievement in the areas of mathematics, science, English and teacher recommendations.

Summer Curriculum

Daily classes were held in mathematics/science, and English. In addition, students were introduced to Navajo Language and Culture and Career Development. The science class was supplemented with daily laboratory experiences and/or field trips. Students were divided into two groups which were facilitated by R.A.'s. A description of each curricular component along with the selected faculty comments follows:

Mathematics/Science: Students were divided into two groups. Math topics were selected to complement the science curriculum as well as to emphasize concepts considered critically important for students in preparation for careers in science and engineering. These concepts included: math scientific method measurement, properties of matter, evolution of time-introduction to geology, ecology-the balance of life, carbon cycle (photosynthesis), energy-solar, wind, hydro, nuclear, coal and oil, global warming and world conference in Rio..

Navajo Language and Culture: The students were introduced to the history and culture of the Navajo people. This class allowed the students to touch base with their heritage. The class was complemented by field trips taken to the aboriginal lands of the Anasazi. The group traveled to Dine'tah area and visited ancient Navajo and Indian dwellings.

English: The English curriculum focused on reading and writing in the specific content area. Class activities included instruction and guided practice in the content, format, language structure, and organization of reports, followed by the development of individual writing assignments. Student assignments included a proposal essay composed and completed in class. Students also were required to keep a journal to record their daily experiences. An English teacher explained the curriculum in more descriptive terms:

> "The end of the 1992 Summer Youth Institute finds us looking back at the program. As we look back we remember both our success and failures. Success, in that we have given our best to our students. This Institute has provided learning opportunities that would make others envious. Everything from a road trip to visit modern day biosphere 2 to a day trip to the past in Dine'tah. The classes they attended were diverse, challenging and exciting. None of this, however, would have been possible without the planning and understanding of the administrative staff. Their coordination and support have insured and environment conducive to both fun and learning."

Career Seminar: The Career Seminar focused on introducing students to the myriad of career opportunities available within the fields of math and science. Throughout the seminar, an emphasis was placed on self-exploration as well as decision making skills. Activities carried out to bring this to pass were: group instruction, individual instruction career discussion, individual review, media materials and video presentations.

Field Trips: Four field trips were taken which complemented all instructional course work. Tours were arranged with the San Juan Power Plant in Waterflow, New Mexico, Los Alamos National Laboratory, Los Alamos, New Mexico, The Biosphere 2 Project in Tucson, Arizona, The Palo Verde Nuclear Generating Plant in Phoenix, Arizona. Other trips included visits to two institution of higher education in Albuquerque, New Mexico: Southwestern Indian Polytechnic Institute and the Native American Program-College of Engineering, at the University of New Mexico.

Study Groups: The study groups were designed to offer support to students as they worked toward the completion of their classroom assignments. Navajo Community College students served as leaders of the study groups. In addition to providing tutoring sessions for students who requested their help, the study group leaders actively encouraged students learning to help each other and also served as viable role models of successful college students.

Other Related Activities

The overall effectiveness of the 1992 summer program was strengthened by several other activities which were spearheaded by the Program Coordinator. A description of several related program activities along with faculty comments follows.

Opening and Closing Programs: The Opening and Closing Programs not only served as an orientation and support group for students, but also served as a means of addressing the well-recognized need regarding increasing parent involvement. In this aim, parents were provided career and college information to facilitate greater understanding of opportunities available for their children. The Navajo Community College program is based on the belief that by involving parents and increasing their knowledge, the parents in turn will be better able to encourage and support their children as they consider scientific and technical career opportunities after the summer program has ended.

Physical Recreation: Students were given access to all recreational facilities available on the Navajo Community College campus. Weekend recreational activities were incorporated in the program as well, to offer students other means of experiencing all aspects of college life. Recreational activities provided additional opportunities for staff and students to interact informally, fostering their getting to know each other better, gaining greater understanding of each other, and, ultimately, developing increased respect for and acceptance of the other's position and point of view.

Staff Meetings: Staff meetings were held regularly throughout the planning and academic phases of the summer program. During the course

of the summer session, weekly staff meetings were held so the student progress could be closely monitored. The information sharing that took place during the staff meetings was of critical importance to the success of the program. The sharing enabled faculty and staff to make revisions/adjustments to their planned curriculum and/or activities to enhance the total effectiveness of the composite program.

FUTURE PROGRAM DIRECTIONS

The overall goal of the Math and Science Summer Youth Institute Program is to encourage a greater number of Native American high school students to acquire the necessary skills to succeed in a rigorous college academic program and to enter math and science-based disciplines. In the decade of the '90's, the program will surge ahead to increase the outreach efforts to parents, students, faculty, and school personnel. The following activities are priorities for each groups.

Pre-College Students

The 1993 program include planning for increased outreach at the pre-college level.

-Develop and strengthen the linkage between the Math and Science Summer youth Institute and other science-based program at Navajo Community College.
-Develop a funding strategy to allow follow-up visits to schools.
-Continue outgoing evaluation/re-evaluation of the program to assure that it is responsive to the students.
-Develop a advertising strategy to increase the number of applicant pool.

Parents

Studies indicate that parents are the primary influence in the student's education. A formal network or system that provides information about colleges, careers, and resource people is needed.

-Provide workshops for parents during summer orientation.

Teachers

In schools with a large population of Native American students, teachers play a prominent role in motivating and identifying future scientists. State-of-the-art instruction and supplemental materials as well as educational opportunities to enhance effectiveness are needed.

-Present appropriate workshops at conferences for teachers and counselors.

PROGRAM ACCOMPLISHMENTS 1992-93

The participants represented twelve schools from the fifteen different towns of the Navajo Nation. The students were selected on the basis of having at least a 3.00 G.P.A. and must have completed the ninth grade. In addition, they were recommended by their math instructors, science instructors and counselor of their respective schools. The total enrollment for the four (4) week institute was thirty, eighteen below the proposed

total. Each of the participants expressed or indicated a strong desire to pursue either a science or mathematical career. Of the thirty applicants twelve students (40%) indicated a career interest in the Engineering field. Computer Science, Home Economics and Health Professions was the second choice for many of the participants. The majority of the students were encouraged most by a parent or guardian to attend the institute and over half of the group attended public schools on or near the reservation. Forty percent indicated a desire to graduate from college, while 23% wanted to seek higher degrees after attaining a 4 year degree. Only one student expressed an interest in attending a vocational type school.

The core of the students came from small towns of the Navajo reservation. One student attended school in the state of New York. His family recently moved into the area and he felt this was an excellent opportunity to continue to explore his career options and more importantly, to learn more about the Navajo people.

CHALLENGES:

With every program, problems and challenges should be expected. This year's institute had its share of challenges. The problems that surfaced were minimal and probably not visible to those viewing the program from outside. The challenges addressed below are a result of mis-communication and the general assumption the assign duties were carried out. Time management became a very important concept that was overlooked at the beginning of our program. As the weeks progressed, improvements were made. It is anticipated that before next year's institute a solution to the challenges can be reached.

There were several minor challenges that surfaced once the program got started. . One concern cited by the R.A.'s dealt with the degree of written assignments given as opposed to the Math/Science assignments. The objectives of the reading/writing class was to familiarize the students with the process of writing a term paper. The final paper was to be five (5) pages and about a scientific interest. The R.A.'s felt this assignment was tedious and required the student to work all the time.

Another concern the R.A.'s expressed was the lack of supervision from the Coordinator when the need arose. One R.A. cited the incident of not being fully informed of the check-out procedures when the time came for the students to leave.

Challenges from the instructional staff were residentially related. All the instructors complained homework wasn't being completed, (especially in the first two weeks of the institute). Another factor mentioned, was that there seem to be no delineation made when an R.A. was to be a friend and when an R.A. had the responsibility to enforce the general rules of the handbook. On several occasions when certain instructors requested assistance from an R.A., the reaction from the resident advisors was uncalled for.

Both R.A.'s and instructors felt that when an assignment was given, the R.A. took it lightly. At times, the R.A.'s were thought to have suggested to the student to do the assignment differently. The R.A.'s on the other hand felt the instructors expected too much from them. They felt the students had no fun time.

It was a consensus from both groups, that a more definite study hour needs to be built into the schedule. Furthermore, everyone agreed one week of math was not enough. Dividing the Math/Science into two different classes would be better. Everyone agreed, field trips were fun but too many. It was difficult getting the students back into an

academic frame of mind when they returned. A point well made by both groups addressed the need to have access to computers daily. Some students complained the writing assignment could have been minimized by the use of computers. It had been arranged earlier with the learning center where computers were available. Computer Services were also available later, but only on weekdays (8 - 5 pm). Whether the students took advantage of this service remains unknown.

PARTICIPANT EVALUATION:

There were two types of evaluations done. One qualitative the other quantitative. The qualitative evaluation was a written synopsis from the students. They were asked to include their overall impressions about the program. The quantitative ranked the different components on a scale of 1 through 5. There was room for comment, but little was stated. Similarities from the two evaluations indicated a dislike for the instructor in the Reading and Writing course. They also indicated they learned the most from this class. A lot of student's initial reaction to the Navajo class was that it was boring, and as time passed, the students developed a real interest in this class. This was probably the best liked class. The instructor for the Career class also received ravening reviews. Not to our surprise, the students claimed a real gap exist in career planning from their high schools. As for the final course taught, reactions were mixed. Many enjoyed the science experiments. A majority of them felt there was too much emphasis in science and not enough in Math.

In terms of instructor preparedness, all instructors were felt to have been fairly prepared. On a couple of evaluations, two students stated they realized assignments were not clearly understood and felt they were to blame for not asking questions.

In terms of overall performance of the program everyone seem to have been satisfied with this year's program. Only one student was not pleased with the program at all. This person indicated he/she would not return if he/she had the opportunity nor would this individual pass information on about the program. Everyone else concluded with a positive view. They want to return next year if the program is continued.

GENERAL IMPRESSIONS:

Looking back over at the program, there are some ambivalence about how well this year's program ran. What makes a program great is its staff. We had very talented staff with excellent credentials, but sometimes having the best staff doesn't make the greatest program. The minor kinks that seem to have snowballed after the departure of the head resident advisor, seem to have left the residential component ill-equipped to handle some of the day to day situations. The instructors also found themselves without a daily assistant to carry out projects that needed to be completed that day. To rationalize the chaoticness of the institute is to recognize the necessity to create a Manual that provides a plan of operation of this program. It is felt that if this program continues, a training manual needs to be developed. This is not to say that chaoticness will cease, but it will minimize the tendency to avoid any animosity between the components and within the components. All in all the staff will do it again!! It was challenging and it was a wonderful learning experience.